THE VETERINARY RECORD

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888

No. 9. FEBRUARY 28, 1953 VOL. 65.

THE USE OF THE NEWER INSECTICIDES FOR THE CONTROL OF THE SHEEP TICK, *IXODES RICINUS*

BY

D. W. JOLLY, L. C. STONES, K. W. PAGE AND G. C. BRANDER,

COOPER TECHNICAL BUREAU, BERKHAMSTED

INTRODUCTION

The control of the sheep tick, *Ixodes ricinus*, has always been a matter of some difficulty, since this parasite spends so long a time under cover of vegetation on the ground, and so short a time on the host sheep.

Up to the time of the development of DDT and BHC and other modern insecticides some attempts had been made to control the sheep tick by the use of dips and other preparations containing arsenic and derris. One of the difficulties associated with control of this parasite is that its season of maximum activity coincides, more or less, with the lambing season, when the shepherd is constantly busy, and when handling of the ewes must be reduced to the minimum. There was, therefore, a great need for development of chemical materials which would give a prolonged period of protection to the sheep, so that the losses due to a heavy tick population could be reduced to a minimum during the critical lambing period.

With the development of the modern insecticides with their pronounced residual properties, there seemed some hope that improved results would be obtained.

The present paper reviews investigations carried out by the Cooper Technical Bureau during the seasons 1946–50, when the acaricidal efficiency of a number of preparations was tested. This paper refers only to the control of the tick on adult sheep. Methods of application for lambs must be rather different, and the results of tests on lambs are reviewed in the paper that follows.

METHOD

The acaricidal efficiency of a preparation has been assessed by comparing the number of adult female ticks on treated and untreated animals. Tick counts were made daily or weekly, from the commencement of the trial until the acaricidal effect of the test product had ceased, or the seasonal decline in the numbers of ticks became apparent.

This work was commenced on a hill sheep farm on the borders of Kincardineshire and Angus. Later, a move was made to the College Valley, near Wooler in Northumberland, where the ticks were more numerous. The preliminary work in Scotland consisted in the treatment with various preparations, of groups of 6 or 10 sheep. After the random selection of the groups, the sheep (Scottish Blackface ewes and hoggs) were marked and released into a fenced area of roughly 120 acres, which formed part of the main hill pasture. These sheep were frequently examined, until ticks were observed, when the various groups were treated with the test preparations. One group remained untreated to act as a control. All the animals were again released on to the tick-infested pasture, and tick counts were made until the end of the test.

Heath (1946) introduced a method of counting ticks, in which a daily assessment was made of the state of engorgement of each adult female tick, and this tick counting technique was employed in the early stages of this work.

Unfortunately, the technique is complicated if tick infestation is heavy and it requires the daily examination of the same sheep, which must therefore be readily available, and yet must be exposed daily to tick infestation. These conditions could not be achieved where a flock was being treated and then exposed to heavy tick infestation on the hill. It was therefore decided to rely on a total count of adult female ticks on a sufficient number of random-selected treated sheep and the comparison of this count with similar counts made on control undipped sheep. In addition to making the total count a note was made of female ticks attached four to five days or more. Adult female ticks were counted on each ear, on the face and in the axillae, and in the early work the thighs were also included.

As the investigation proceeded, it became apparent that tick counting as a method of evaluating the protective properties of an acaricide could be complicated by a number of factors, of which the most important was the number of ticks present during the period of the test. In those cases where the maximum tick infestation was below 30 ticks per sheep, a good percentage "protection" was afforded by various preparations, for several weeks. However, when the average tick infestation per sheep was substantially over this figure, the protection was decidedly shorter.

Two examples of this are given in Table I, the first of which shows that the "protection" afforded by a 0·5 per cent. BHC (0·065 per cent. gamma BHC) suspension dip was over 90 per cent. for three weeks, when the tick infestation of the untreated sheep was below 20 female ticks. However, the same preparation, at the same strength, was capable of maintaining only a 60 per cent. "protection" after three weeks when the average number of ticks per untreated sheep exceeded 40. The second example emphasises the same effect; a 0·05 per cent. BHC emulsion showed a "protection" which exceeded 80 per cent., after three weeks, when a low average tick infestation was encountered, but the same emulsion (at four times the strength) failed to provide any evidence of acaricidal effect after three weeks, when a heavy tick infestation occurred.

Many other examples were encountered and it was clearly established that a significant difference existed in the protection afforded by a dressing when tested under conditions of light and heavy tick infestation. It was concluded that while testing against light infestations could give some idea of the relative value of different preparations, it was not wise to draw any conclusions about length and degree of protection until the preparation had been tested against a numerous and active tick population.

The earlier tests were done on a farm where tick infestations were light, but a move was later made to the Wooler area, where tick counts often exceeded 100 adult females per animal during the peak period. Facilities here did not allow such frequent tick counts, and, furthermore, the number of ticks was too high for the Heath tick counting technique to be employed; a system was therefore used in which a part of a flock was marked, and released on to the hill, while the remainder of the flock was dipped or sprayed and turned

out on to the same pasture. Periodic tick counts were made subsequently, in which an average of 20 treated and 20 untreated sheep were examined.

In the tables presenting the results of the various tests the average number of adult female ticks per treated animal is expressed as the numerator of a fraction, of which the average number of adult female ticks per untreated sheep is the denominator. Thus $\frac{4}{20}$ indicates that there was an average of four ticks per treated sheep and 20 ticks per untreated control sheep. From this fraction a figure representing " percentage protection " is obtained, *i.e.*, $\frac{4}{20}$ shows that for every 100 ticks found on an untreated sheep, 20 were present on the treated animal, which is represented in the tables as 80 per cent. protection. The fraction will assist the reader to make his own interpretation of the value of the percentage protection indicated.

In this paper concentrations of DDT are given in terms of the technical product containing approximately 75 per cent. of p.p.'DDT. Most of the BHC preparations used were based on technical BHC containing approximately 13 per cent. of gamma BHC. Concentrations are given in terms both of BHC (total isomers) and of gamma isomer of BHC.

formulation problems associated with dipping, thereby proving to be a useful method of application for testing the acaricidal properties of experimental preparations. The merits of these two methods of control as practical measures will be discussed later in this paper.

Materials Tested and Assessment of Results

Throughout this work a large number of different formulations and combinations of insecticides was tried. Preparations containing arsenic, derris, DDT, BHC and toxaphene were used and formulations included wettable powders, pastes and various types of emulsion.

It is impossible in this review to present all the detailed data which has been accumulated, or to give details of all the formulations which were tried. A good deal of the earlier work was concerned with the testing of preparations which included cationic wetters, since the work of Heath & Mitchell (1946) had suggested that formulations of this kind might be valuable. It was found that these " cationic " preparations could not be used as dips owing to the high rate of exhaustion, though their results when applied by the selective spray method were good and often spectacular. Obviously the success of the cationic emulsion resulted from the deposition of large amounts of insecticide on the animal, and in our later work we tended to try the application of higher concentrations of insecticide in non-cationic preparations as well as in cationic preparations.

Table I

The Effect of the Tick Population Density on the Apparent Residual Protection of an Acaricide

Preparation	Wash strength	Approximate equivalent concentration gamma BHC	Method of application	Results of tick counts Days after the application of acaricide		
				7th day	14th day	21st day
1. BHC suspension (wettable paste)	0·5% BHC	0·065%	Dip	$\frac{0·5}{6}$ 92%	$\frac{1}{17}$ 95%	$\frac{1}{13}$ 92%
2. Same preparation	0·5% BHC	0·065%	Dip	$\frac{10}{63}$ 85%	$\frac{17}{49}$ 65%	$\frac{28}{65}$ 57%
3. BHC emulsion	0·05% BHC 0·05% phenols	0·0065%	Dip	$\frac{0·1}{10}$ 99%	$\frac{0·6}{7}$ 92%	$\frac{0·9}{7}$ 88%
4. Same preparation	0·2% BHC 0·2% phenols	0·026%	Dip	$\frac{5}{40}$ 78%	$\frac{12}{20}$ 40%	Nil

In this and following tables the control effected is shown as a fraction :— $\frac{\text{the average number of adult female ticks per treated sheep}}{\text{the average number of adult female ticks per control untreated sheep}}$ The fraction is then presented as a " percentage protection."

Methods of Application

Two methods of application were used ; dipping, and " selective spraying." Dipping consisted of immersion for 15 to 20 seconds, and it was observed that in the open-woolled breeds, this time of immersion gave a reasonable degree of wetting. " Selective spraying " involved the application of the test preparation to the areas where the ticks attached, and the hair and wool in the adjacent area. Reasonable coverage could be obtained with 1¼ pints per animal using the conventional type bucket pump and a coarse spray jet. This method of application allowed a considerable saving in the amount of test material required, and overcame some of the

In assessing the results of the application of an acaricidal preparation designed for the control of sheep tick, it seemed necessary to consider (*a*) the immediate kill of parasites present at the time of treatment and (*b*) the " protection " afforded against further attack.

" Protection " may be of two kinds. The insecticide may have repellent properties and discourage ticks from attaching, or it may act by killing ticks after they have attached.

Results

(*a*) Comparison of DDT and BHC

A good deal of the earlier work was done with DDT

preparations but some BHC preparations were included and it soon became apparent that in similar formulations there was little to choose between these insecticides for the control of *Ixodes ricinus*. Table II gives an example.

periods and the numbers of female ticks completing engorgement in successive six-day periods.

The effectiveness of both these preparations is demonstrated by the fact that only six to seven adult female ticks were able

Table II

Selective Spraying with Similar Cationic Preparations of BHC and DDT Groups of Six Blackfaced Hoggs

Preparation	Insecticide (technical)	Active isomer	Numbers of ticks attaching in successive three-day periods	Total	Numbers of female ticks completing engorgement in successive six-day periods	Total
M.37 cationic DDT ...	0·5%	0·4% pp′	0, 1, 0, 0, 1, 0, 0, 1, 3, 7, 6, 7	26	2, 0, 0, 0, 0, 5	7
M.37 type cationic BHC	0·5%	0·065% gamma BHC	5, 1, 0, 0, 0, 0, 0, 7, 12, 7, 1, 4	37	1, 0, 0, 0, 2, 3	6
Untreated controls ...	—	—	6, 11, 8, 7, 4, 5, 2, 12, 36, 44, 32, 20	187	2, 15, 15, 6, 16, 69	123

The DDT preparation was the D.S.I.R. M.37 preparation containing solvent naphtha, acetic acid and a cationic wetter (Fixanol C). (For details see Heath, 1946.) A similar preparation was made, using BHC to replace the DDT. Both preparations were used as selective sprays at an insecticide concentration of 0·5 per cent. of the technical material. The Heath method of assessment was used and Table II shows the numbers of ticks attaching in successive three-day

to complete engorgement on a group of six sheep over a period of 36 days, while 123 ticks engorged on a similar group of untreated sheep.

(*b*) Results of Dipping Tests—Miscellaneous Preparations

Table III illustrates the results obtained at various times with various preparations.

Table III

Results of Miscellaneous Tests—Dipping

Preparation	Wash strength: BHC total isomers	Wash strength: % gamma BHC	Wash strength: Other active ingredients	Year	Flock No.	Results of tick counts, approximate No. of days after dipping: 7 days	14 days	21st day	28th day	35th day
1. BHC suspension 50% wettable paste	0·5	0·065	—	1947	1	0·4/7 94%	1·9/13·2 86%	4·2/8·3 50%	—	—
2. Same preparation ...	0·5	0·065	—	1948	2	1·4/35 96%	2/14·2 86%	1·4/5·6 75%	—	—
3. Same preparation ...	0·5	0·065	—	1948	3	—	52/146 68%	38/90 58%	—	—
4. Same preparation ...	0·5	0·065	—	1948	5	16·5/123 87%	30/55 44%	—	—	—
5. Same preparation ...	0·5	0·065	—	1948	7	3·6/18·3 86%	2·2/13 83%	2·5/5·4 54%	—	—
6. Same preparation ...	0·5	0·065	—	1949	5	10·3/63 84%	17/49 65%	27·6/65·2 57%	24·8/42·9 42%	22/24 8%
7. Same preparation ...	2·0	0·26	—	1949	8	0·7/58 98·8%	2/64 97%	14·6/82·0 82%	20·7/61·3 66%	20/58 65%
8. Black fluid emulsion of BHC	—	0·005	0·05% phenols	1946	1	0·1/10 99%	0·6/7·5 92%	0·9/6·3 86%	0·7/8·0 91%	—
9. Same preparation ...	—	0·02	0·2% phenols	1948	8	5/40·5 88%	12·2/20·4 55%	9·1/9·3 Nil	—	—
10. DDT/BHC wettable paste	0·1	0·013	pp′DDT 0·3%	1948	5	47/123 62%	39/81 52%	—	—	—

Preparation	Wash strength: BHC total isomers	Wash strength: % gamma BHC	Wash strength: Other active ingredients	Year	Flock No.	Results of tick counts, approximate No. of days after dipping: 7 days	14 days	21st day	28th day	35th day
11. Same preparation ...	0·1	0·013	pp'DDT 0·3%	1948	3	—	35/146 76%	47/90 48%	—	—
12. M.37 DDT cationic emulsion	—	—	pp'DDT 0·4%	1948	5	55/123 55%	63/84 25%	—	—	—
13. DDT/derris wettable powder	—	—	DDT 0·5% derris extract 0·02%	1947	1	1/4 75%	1/18 94%	2/16 87%	—	—
14. DDT / arsenic wettable powder	—	—	DDT 0·5% As_2O_3 0·2%	1947	1	0·6/4 85%	1/18 94%	2/16 87%	—	—
15. DDT suspension wettable powder	—	—	DDT 0·2%	1946	1	0·8/10 92%	2/7 72%	1/7 86%	—	—

The preparation most frequently used was a commercial BHC 50 per cent. wettable paste diluted to yield 0·5 per cent. BHC (total isomers) equivalent to a wash concentration of 0·065 per cent. gamma BHC. The results with this preparation indicate clearly the fallacy of judging any tick dip on a low tick population. Nevertheless, even against heavy tick populations the product gave a reasonable degree of control.

In an attempt to increase the degree of control obtained, the same preparation was used at quadruple concentration (a wash strength of 0·26 per cent. gamma BHC). This proved remarkably successful (see Table III, preparation 7) and a protection of 97 per cent. at 14 days had fallen only to 65 per cent. after 35 days. The large flock dipped in this preparation showed no ill-effect from immersion in this high concentration of insecticide.

Reference to preparation 12 in Table III shows that M.37 cationic emulsion failed completely when used as a dip. Various DDT preparations (13 to 15 in Table III) gave very good results in early work but tick populations were low and no firm conclusions could be drawn. These figures again bring out the importance of testing on larger tick populations. The results achieved with preparation 15 (0·2 per cent. DDT) seem quite striking, but a later test with preparation 10 (0·3 per cent. DDT, 0·1 per cent. BHC) was done under conditions of much heavier tick counts and the results were greatly inferior.

(*c*) Initial Kill

Examination of sheep shortly after dipping can give a very misleading picture of the effectiveness of a dip. BHC and DDT gave a comparatively slow kill and the nearly engorged female tick was strongly resistant to the insecticides. The initial kill with the insecticides was poor, and several days elapsed before the bodies of the sheep were clear of ticks.

(*d*) Results of Spraying Trials

The results of a miscellaneous series of selective spraying trials are shown in Tables IV and V.

Table IV shows the results of a series of tests with the same BHC preparation at varying concentrations. The results at 0·5 per cent. BHC (0·065 per cent. gamma BHC) were not as good as can be obtained by dipping at the same strength, but the protection afforded by 10 times this concentration

Table IV

Selective Spraying—BHC Preparations

Preparation	Insecticide	Concentrate	Year	Flock No.	Results of tick counts—days after application: 1	5	8	12	16
BHC suspension 50% wettable paste	BHC (total isomers) / Gamma BHC ...	5·0 / 0·65	1948	2	4·5/39·8	0·3/56·1 99%	0·6/41·1 99%	0·3/21·8 99%	0·3/14·6 99%
Same preparation ...	BHC (total isomers) / Gamma BHC ...	2·5 / 0·33	1948	2	8·5/39·8	2·3/56·1 96%	3·5/44·1 92%	4·8/21·8 78%	4·1/14·6 72%
Same preparation ...	BHC (total isomers) / Gamma BHC ...	1·0 / 0·13	1948	2	19/39·8	5·8/56·1 90%	10·1/41·1 75%	13·1/28·8 40%	10/14·6 31%
Same preparation ...	BHC (total isomers) / Gamma BHC ...	0·5 / 0·065	1948	2	20·5/39·8	10·1/56·1 82%	9·5/44·1 77%	9·8/21·8 55%	6·3/14·6 57%

TABLE V

SELECTIVE SPRAYING—MISCELLANEOUS PREPARATIONS

Preparation	Insecticide	Concentration	Year	Flock No.	Results of tick counts—days after application			
					7	14	21	28
DDT/white spirit emulsion cationic	DDT	2·5	1947	1	0·2/6·7 97%	24/17·7 86%	6·0/11·2 47%	—
DDT/white spirit emulsion anionic	DDT	2·5	1947	1	0·2/6·7 97%	4·2/17·7 72%	8·6/11·2 24%	—
DDT/Pyrethrum emulsion	DDT ... ... Pyrethrins ...	2·5 1·0	1947	1	0·1/6·7 99%	3·6/17·7 80%	7·6/11·2 32%	—
BHC wettable powder (anionic)	BHC (total isomers) Gamma BHC ...	2·5 0·33	1949	5	3/43 93%	10·2/66·4 85%	30/63 52%	4/65·3 30%
BHC wettable powder (cationic)	BHC (total isomers) Gamma BHC ...	2·5 0·33	1949	5	5·6/49 88%	17·3/34·7 50%	25/37·5 33%	19·0/24·0 20%
M.37 type BHC cationic emulsion	BHC (total isomers) Gamma BHC ...	1·5 0·33	1949	3	1·0/34 97%	3·4/31·7 90%	13·2/33·0 60%	13·7/16·0 14·4%
M.37 DDT cationic emulsion	DDT	1·5	1948	6	1·4/28 95%	3·3/49·5 94%	1·5/16·0 91%	—
Toxaphene 65% emulsion	Toxaphene ...	0·5	1948	3	—	139/146 5%	71/90 21%	—

used as a selective spray was still virtually complete after 16 days. Unfortunately, a falling tick population prevented further work. Table V shows results of various selective spraying tests with a variety of other preparations.

It will be seen that toxaphene (0·5 per cent.) gave poor results and this has since been confirmed on spraying tests made on *Ixodes ricinus* on cattle. This insecticide, which is superior to DDT and BHC for control of *Amblyomma* and *Boophilus* ticks, appears comparatively ineffective against *Ixodes* species.

The M.37 formulation and its BHC counterpart give good protection, but it will be noted that the inclusion of a cationic wetter in a wettable powder type of formulation did not improve the protection obtained with a similar anionic preparation. It is considered that the M.37 type of formulation owes its efficiency to its instability in the presence of wool when the emulsion breaks, leaving much of the DDT on the sheep. This is a property which makes it of great value when applied as a selective spray, but quite useless when applied as a dip, as most of the DDT is removed by the first sheep passing through the dip, as indicated in Table VI (over-leaf).

The other preparations indicated in Table V need no additional comment.

(*e*) Exhaustion of Insecticides in Dipping Washes

Since the modern insecticides are insoluble in water, it has been necessary to apply them in the form of suspensions or emulsions. Some degree of exhaustion is therefore inevitable since the sheep's fleece acts as a filter for the wash draining from its body. In general, it has been our experience that exhaustion of the active principle has been more serious in emulsion dips than with suspensions.

Table VI shows a comparison of the ratio of exhaustion of the M.37 DDT emulsion, to which reference has already been made, with a suspension of BHC and DDT/BHC. Replenishments, in the case of the two suspension dips, were made at one and one-quarter times original strength, but the replenishment of the M.37 dip was made at normal strength. These dippings were done in baths of 240 to 300 gallons.

The figures show very clearly that very heavy exhaustion took place in the case of the M.37 dip and this is reflected in the very poor results of tick control observed in the case of the last five sheep through the bath. On the other hand, the concentration of the suspension dips was well maintained and results of dipping the last five sheep were similar to the results obtained with the first five.

(*f*) Analysis of Spray Wash Samples

During the course of spraying trials analyses were made of the wash applied and the wash dripping from the sheep and some of these figures are presented in Table VII.

TABLE VII

ANALYSES OF SAMPLES OF SPRAY WASHES CONTAINING CATIONIC OR ANIONIC WETTERS

Preparations	DDT or BHC per cent.	
	Spray wash concentrations	Drippings from sheep
1. White spirit emulsion/cationic/DDT	1·15	0·48
2. White spirit emulsion/anionic/DDT	1·18	1·12
3. Wettable DDT powder/cationic ...	0·49	0·13
4. Wettable DDT powder/anionic ...	0·49	0·35
5. M.37—DDT/cationic	0·48	0·09
6. M.37 type—BHC/cationic	0·25	0·06

Note.—Considerable top oil separation had taken place in the sample of "drippings" from Group 1 making withdrawal of a portion for analysis difficult; the DDT content recorded may therefore be in excess of that actually present.

TABLE VI
EXHAUSTION OF DDT AND BHC IN A DIP

Preparation	Sampled	Analysis of wash		Tick control					
				7 days		14 days		21 days	
M.37 DDT emulsion cationic	Original	0·39% DDT	Average first five sheep	0/14	100%	—		2/80	97%
	After 101 sheep	0·06% DDT							
	After 168 sheep	0·11% DDT	Average last five sheep	11/15	27%	—		54/80	35%
	Replenished after 101 sheep								
BHC suspension	Original	0·48% BHC	Average first five sheep	2/35	94%	3/14	79%	—	
	After 60 sheep	0·47% BHC							
	After 124 sheep	0·46% BHC	Average last five sheep	1/35	97%	2/14	86%	—	
	Replenished after 60 sheep								
BHC/DDT suspension BHC = 0·1% total isomers DDT = 0·3% tech. DDT 0·4%	Original	0·39% DDT and BHC	Average first five sheep	2/35	95%	1·6/14·2	89%	—	
	After 119 sheep	0·35% DDT and BHC	Average last five sheep	2/35	95%	2·2/14·2	84%	—	
	Replenished at 60 sheep								

These figures show that wherever a cationic wetter was incorporated in the formulation, the drippings from the sheep contained substantially less of the insecticide than did the original spray wash. This effect was most marked in the case of the M.37 formulations.

DISCUSSION

The parts of the sheep favoured by the tick are, for the most part, free of wool. The face and ears usually have a good covering of hair, which does not retain a dressing as readily as wool, whilst the axillae and thighs are free of all covering. Furthermore, the face and ears, and to a lesser degree the other areas of tick attachment, are frequently brushed by herbage, and any insecticidal preparation is liable to be rubbed off, as the animal grazes, or by intent, if there is any local irritation. The treated wool surrounding these parts may remain as a poison barrier through which those ticks collected by the wool tips will migrate to their areas of attachment. However, those ticks which reach the selected areas directly without passing through the wool, may be able to complete their engorgement without being exposed to lethal amounts of insecticide. For these reasons, a long residual protection against reinfestation by tick, through the application of an acaricide, is not easily attained.

Apart from this, there were indications that few ticks are killed once they have attached. As mentioned previously, a note was made in some trials of the number of ticks present, which had been attached for four days or more. When these numbers were compared for treated and untreated sheep, it was found that the dips gave much the same "protection" as when total counts were compared. This could only have meant that the killing action of the insecticide was mainly confined to those ticks which had not attached. The protective action of the insecticides, therefore, appears to consist more of a sub-lethal action amounting to repellancy, rather than a direct lethal action on attached ticks.

The figures presented show that a good control of the sheep tick (*Ixodes ricinus*) can be achieved by dipping sheep in suspensions of DDT or BHC of the order of 0·5 per cent. of the technical grade insecticide, and that the degree of control can be increased markedly if the concentration of insecticide is increased to 2·0 per cent. (0·26 per cent. gamma BHC). In practice, a BHC suspension product yielding 0·065 per cent. gamma BHC in the wash has been widely used for the dipping of ewes shortly before lambing and for the dipping of hoggs and young lambs, and results in the field have been satisfactory.

Our attention was drawn early to the possibilities of spraying the predilection sites of the tick as a possible practical method of control and although we first used this "selective spraying" as an experimental method, we always had in mind that, if effective, it might prove a useful and economical alternative to dipping. In contrast with dipping, great economies of material were possible, since only 1½ pints of fluid were needed to give adequate coverage of the selected parts. This meant that much higher concentrations of insecticide could be used than was economically possible in the case of dipping. A direct comparison of the two methods showed that results afforded by spraying were inferior to those obtained by dipping with the same formulation and strength of insecticide (except in the case of the M.37 cationic preparations). Using higher concentrations it was possible to obtain very good results (see especially 5·0 per cent. BHC, Table IV) but in practice the method of selective spraying proved time con-

suming and laborious. In order to spray the axillae and groins each animal must be turned up, and the operator handling the sheep requires to wear good waterproof protective clothing.

A direct comparison of dipping and selective spraying was made on one farm where, with adequate labour available, it took one and a half hours to dip 250 ewes. On the same farm it took more than three hours to treat only 131 ewes by the selective spray method.

It was felt, therefore, that whatever the attractions in the method of applying small amounts of high concentrations of insecticide to the predilection sites of the tick, the method was not one which could be recommended as practical under ordinary farming conditions.

Summary and Conclusions

The paper reviews a series of field trials stretching over several years, on the value of the modern insecticides against *Ixodes ricinus* infestations on adult sheep.

Groups of sheep were dipped or sprayed and then exposed to tick infestation. Periodic post-treatment examinations are recorded and the following observations made :—

(1) BHC used in a wash concentration of 0·065 per cent. gamma BHC gave a good kill and reasonable protection against reinfestation. An increase in concentration up to four times this strength substantially improved the degree of protection.

(2) DDT was less extensively tested, but within the limits of the tests employed, this insecticide gave results comparable with BHC.

(3) Toxaphene did not appear to be as satisfactory as BHC or DDT.

(4) The degree of infestation significantly influenced the degree of protection achieved. Where infestation was high, the residual protection was markedly shorter than where a moderate or low infestation existed.

(5) The application of small amounts of higher concentration of insecticide to the predilection sites of the tick (" selective spraying ") was economical in material and gave results nearly comparable with dipping but the method was slow and laborious and not to be recommended under practical farming conditions.

(6) The use of a cationic wetter with BHC and DDT formulations appeared to result in the deposition of a greater amount of the insecticide on the skin, wool and hair of the animal but cationic preparations were shown to be unsuitable for dipping and only of value when a non-returnable spray method was used.

Acknowledgments.—The authors wish to record their thanks to a number of people who actively assisted in the various trials, and in particular to Mr. S. A. Evans, Miss B. Bailey, Mr. G. H. Gilbert, Mr. R. N. Kay, M.S.R.C.V.S., also to Dr. McHardy, B.V.Sc. (South Africa), Mr. G. J. Shanahan, B.Sc. (Australia), Miss F. H. Handley, Messrs. A. A. M. McDougall and G. Betteridge.

They also thank members of the Cooper Technical Bureau for their assistance in making the various preparations used in the trials, and for completing the analyses, and Mr. H. E. Harbour for his supervision and advice in connection with the trials and the preparation of this paper, and Messrs. Cooper McDougall & Robertson, Ltd., for their permission to publish this paper.

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TREATMENT OF LAMBS FOR THE CONTROL OF THE TICK (*IXODES RICINUS*)

BY

G. C. BRANDER, K. W. PAGE, L. C. STONES

AND

D. W. JOLLY

Cooper Technical Bureau, Berkhamsted

Introduction

The period of maximum activity of the sheep tick, *Ixodes ricinus*, is, in most areas in this country, during the months of April and May. It is at this time that lambing takes place on the average hill farm and young lambs are attacked by the tick immediately after they are born. The bite of the tick, in addition to its association with louping-ill, tick-borne fever and tick pyaemia, can cause a severe cutaneous reaction in lambs, with subsequent abscess formation. For these reasons ticks can cause a heavy mortality among lambs. Every effort should be made to reduce the lamb's tick burden.

The application of an acaricide to the lamb for the control of tick is complicated by the problem of gathering the ewes and lambs, and the fact that young lambs are being born throughout April and early May. Any treatment, therefore, must be continued throughout this period, so as to include the late arrivals. The mustering of young lambs is very difficult, and the consequent disturbance of the ewes is undesirable ; for these reasons, therefore, dipping is not practicable. Acaricide can be applied by the use of a spray, a dusting powder, a salve, or a lotion. All these methods and, in addition, dipping, were examined during the trials under review.

1947 TRIALS

Materials and Methods

In the preliminary trials, carried out in 1947, the following preparations were tested :—

(*a*) Dibutyl phthalate 20 per cent. in wool grease.
(*b*) Dibutyl phthalate 10 per cent., DDT 10 per cent., in wool grease.
(*c*) Derris dusting powder, 1 per cent. rotenone.
(*d*) DDT cationic emulsion (2·5 per cent. DDT).

Groups of 40 lambs were marked and used for each test preparation, which was applied to the left ear, axilla and thigh, leaving the right ear, axilla and thigh untreated to serve as control. Lambs were treated on two days prior to release on to the hill with their mothers.

The greasy dressings were applied by hand and the emulsion formulation by swabbing with a cloth.

Results

A check on the results of the treatment was made by examining groups of lambs at intervals after the dressing and comparing tick counts. Unfortunately, it proved difficult to obtain a sufficiently representative number of lambs at each subsequent gathering from the hill, and tick numbers were low so that the results obtained (see Table I, over-leaf) did not allow of any firm conclusions being drawn.

However, some general observations on the usefulness of lamb dressings can be made.

Maclagan (1946) reported on the efficacy of a dibutyl phthalate salve for the treatment of lambs. In these pre-

liminary trials the protection obtained with salves containing dibutyl phthalate and dibutyl phthalate and DDT were undoubtedly good, but the preparations were messy and difficult to apply, and the shepherd reported that some lambs treated with these salves were difficult to "mother-up." Moreover, a significant number of the lambs treated with the salves was blistered severely in the axilla and thigh region. These formulations were, therefore, regarded as unsatisfactory, and no further trials were done with them.

The 2·5 per cent. DDT emulsion preparation was easy to apply but the protection achieved was distinctly less than in the case of the two salves. Powdering gave rather unreliable results and was wasteful. Most of the powder was shaken off when the lambs were released and though the initial kill may be good little real protection was achieved.

TABLE I

Preparation	Method of application	Comparative average tick counts Days after application			
		14 days		21 days	
Dibutyl phthalate 20%	Salve	0·16 / 3·4	95%	0·6 / 3·2	80%
Dibutyl phthalate 10% DDT 10%	Salve	0·07 / 1·4	95%	0·1 / 1·01	80%
Derris 5%	Dusting powder	0·75 / 2·75	70%	0·66 / 2·1	69%
DDT 2·5% cationic emulsion	Swab	0·5 / 1·8	72%	1 / 1·25	16%
Controls	Untreated	2·5 / 2·0		2·5 / 1·66	

As in the previous paper (Jolly *et al.*, 1953), the "protection" afforded by an acaricidal preparation is expressed as a percentage and a fraction is also given which represents

$$\frac{\text{Average number of ticks per treated lamb}}{\text{Average number of ticks per control untreated lamb}}$$

1948 TRIALS

Materials and Methods

The following preparations were tested :—

(*a*) Benzene hexachloride wettable paste diluted to give 5 per cent. BHC (0·625 gamma BHC).

(*b*) DDT wettable paste diluted to give 5 per cent. DDT (technical).

(*c*) Liquid emulsion cream—2·5 per cent. BHC (0·3 per cent. gamma BHC).

(*d*) Lanolin cream emulsion—2·5 per cent. BHC (0·3 per cent. gamma BHC).

(*e*) BHC emulsion dip—0·25 per cent. BHC (0·025 per cent. gamma BHC + 0·2 per cent. phenols).

The first three preparations were applied to the predilection sites with a sponge, the fourth was smeared on, while the fifth was used as a dip. In the case of the preparations applied with a sponge, it was found that a good wetting of the selected sites could be achieved if the liquid was used at the rate of 1 gallon per 25 lambs.

Results

Inclement weather with snow severely hindered and reduced activities so far as mustering and handling of young lambs were concerned. Moreover, the tick population, even on the fells, began to fall off rapidly so that the figures obtained for percentage protection cannot be regarded as very significant.

Observations were carried out on five hirsels and a summary of results is given in Table II. Pre-treatment tick counts were of the order of 20 to 28 per lamb.

TABLE II

Preparation	Hirsel	Comparative average tick counts and "per cent. protection." Days after application												
		5	6	7	8	9	10	12	13	14	16	19	21	23	29
5% BHC suspension sponged	1	—	0·4 / 3·5 89%	—	—	—	—	—	1·5 / 6·3 76%	—	—	—	—	—	1·1 / 1·5 27%
Ditto	2	—	—	0·75 / 6·3 88%	—	—	—	—	—	—	—	—	—	1·5 / 1·5	—
5% DDT suspension sponged	2	0 / 6·3 100%	—	—	—	—	—	—	—	—	—	—	0·3 / 1·5 80%	—	—
Ditto	3	—	—	2 / 19 90%	—	—	—	—	—	—	1·6 / 6 74%	—	—	0·8 / 2·8 72%	—
Liquid cream 2·5% BHC sponged	4	—	—	—	—	0 / 6 100%	—	—	0·2 / 2·8 93%	—	—	—	—	—	—
Lanolin cream 2·5% BHC smear	5	—	—	—	—	—	—	3·3 / 10·6 69%	—	—	—	11·3 / 11 Nil	—	—	—
BHC emulsion 0·2% BHC dip	4	—	—	1·3 / 6 78%	—	—	0·3 / 6 95%	—	—	1·8 / 2·8 39%	—	—	—	—	—
Ditto	6	—	—	—	0 / 3·2 100%	—	—	—	—	—	—	—	—	—	—

Swabbing of the lambs with spray material proved simple, expeditious, and reasonably economical and either a liquid cream dressing or a liquid dip could be applied by this method. The lanolin cream was sticky and difficult to apply. Dipping of lambs did not cause any mis-mothering but the experience gained suggested that wholesale dipping of very young lambs under fell conditions was not very practicable owing to difficulties in mustering and long distances from dipping tanks. Some trials were done with a small " dustbin " dip bath but in general it was found that the sponging method was simpler and more practical.

In one flock over 20 per cent. of the lambs, prior to treatment, were suffering from abscess formation in the axillae and groins as a result of tick infestation, and it was gratifying to find, within a week of swabbing with a BHC preparation, that there was more or less complete freedom from ticks, and old abscess lesions rapidly resolved with a subsequent general all-round improvement in the lambs.

1949 TRIALS

As a result of the previous years' trials, it was concluded that a useful protection from ticks could be given to young lambs by swabbing predilection sites with liquid preparations of BHC, and that the method of application with a sponge was simple and practical. It was therefore decided to carry out field trials in 1949. Three flocks were used, representing approximately 800 to 900 lambs and the BHC (2·5 per cent.) cream was carried by the shepherds, and applied to lambs as soon as possible after their birth. A number of lambs was left untreated to act as controls.

Examinations of the flocks were subsequently carried out and tick counts on treated and untreated lambs were done. The length of protection afforded by the tick cream was estimated by the judged age of the lamb.

The substantial numbers of lambs used in the trial compensated for the imperfections in this method of assessment.

Results are recorded in Table III.

Table III

Results of Field Trials using Tick Cream containing 2·5 per cent. BHC (0·3 per cent. gamma BHC) Comparative Average Tick Counts

Flock	Percentage protection in weeks after application			
	2 to 3 weeks	3 to 4 weeks	4 to 5 weeks	5 to 7 weeks
1	$\frac{2}{20}$ 90%	$\frac{1·6}{4·5}$ 65%	—	$\frac{3}{6}$ 45%
2	$\frac{0·3}{9}$ 97%	$\frac{3·5}{11}$ 69%	—	—
3	$\frac{0·5}{14·5}$ 96%	$\frac{0·6}{4·5}$ 86%	—	—
4	—	—	$\frac{3·3}{11}$ 70%	—

Discussion

During the course of these trials various methods for the application of an acaricidal preparation to lambs have been tested. These included dipping, spraying, dipping in a barrel or dustbin, dusting, smearing and swabbing.

Dipping and spraying methods, while they did not harm the lamb or cause mis-mothering, did not prove practicable since they caused much interference with flock routine at a critical period. The transport of equipment and the need for additional labour to assist in the application of the acaricide were not justified by the results, which were actually inferior to those obtained with the simpler method of sponging with cream preparations.

It became evident, quite early in the trial, that the ideal preparation was one which could be easily carried by the shepherd, and applied single-handed by him to newly born lambs. These requirements were met by a dusting powder, salve or a lotion. Dusting powders obviously did not have the necessary residual properties while the greasy salves tested were messy, difficult to apply, and caused blistering of the skin. It was found that a salve of the consistency of liquid cream was easy to apply with a small sponge, and the shepherd could readily carry a small can of the material which sufficed for the treatment of his daily crop of lambs. Lambs were treated soon after birth when they could be caught readily, and were thus provided with protection at an early period in their life. The benefits of the treatment could be seen in better thriving of the young lambs and freedom from the skin abscesses which frequently result from infected tick bites.

Whether the aim of the flockowner be complete tick eradication or merely seasonal protection from tick worry with consequent reduction of tick-borne disease, protection of the lamb crop is of prime importance. The older sheep in the flock undoubtedly gain some tolerance from previous infestations, and the majority settle down after the first tick rise, but hoggs, and more particularly lambs, will never attain their full potential development if tick worry and tick-borne disease is not reduced to a minimum. The hoggs can readily be mustered with the ewes and can be dipped even more frequently if deemed necessary, but the lambs present a more difficult problem.

The trials recorded here, together with subsequent reports of large-scale field use, have confirmed that a liquid cream containing 2·5 per cent. BHC (0·3 per cent. gamma BHC) is a practical and satisfactory tick dressing which gives a high degree of freedom from tick for the first two to three weeks of the lamb's life. At the age of three to four weeks the lambs can, if necessary, be mustered and dipped, along with their mothers, thus providing protection for the remainder of the tick season.

Summary

A number of different preparations and methods for tick control on young lambs was tested, during the seasons 1947 to 1949. Dipping and spraying of very young lambs was rejected on account of difficulties of labour and transport of equipment. A derris dusting powder did not give sufficient residual protection, while greasy salves proved difficult to apply and caused blistering of the skin and some " mis-mothering."

The best practical results were obtained with a liquid emulsion cream containing 2·5 per cent. benzene hexachloride (0·3 per cent. gamma BHC) applied with a sponge to the ears, axillae and thighs of the new-born lamb. This was simple to apply and gave good protection for two to three weeks and the treated lambs throve and remained free from infected tick bites and skin abscesses.

References

Jolly, D. W., Stones, L. C., Page, K. W., & Brander, G. C. (1953). *Vet. Rec.* **65**. 131.

Maclagan, D. S. (1946). *Nature*. **158**. 132.

CLINICAL COMMUNICATION

ANTHRAX

P. D. G. BOWEN, M.R.C.V.S.,
Bishop's Castle

The following two outbreaks of anthrax are not unusual, but with the present increased incidence of this disease, particularly in pigs, they may serve as a warning to the unwary.

Outbreak No. 1

Three out of seven Essex gilts had aborted at approximately 90 days. They were apparently otherwise normal except that one showed a slightly elevated temperature (103·5°). No reasonable explanation could be given and they were kept under observation, no other action being taken However, two and a half days later, three more gilts had aborted and the first three were now obviously ill.

All were off food, with temperatures varying from 107° to 109°, with somewhat distressed and noisy breathing. Two appeared to be swollen around the throat.

Diagnosis was inconclusive but because of previous outbreaks on the farm, erysipelas was suspected though the possibility of anthrax was considered.

Treatment with four 12-hourly injections of Distaquaine fortified, 300,000 + 100,000 units, resulted in an uneventful recovery. One gilt apparently remained free from infection and has since farrowed.

On the second day of treatment a month-old calf in the paddock where pigs normally ran, dropped dead in a "fit." Because of suspicion of anthrax in pigs having been considered, a blood smear was taken. It proved positive for anthrax bacilli and the diagnosis was later confirmed by Weybridge.

The common source of infection was probably refuse, sacks and old sacking material on a dump in the paddock behind the house.

It is interesting to note that the Anthrax Order makes no provision for live animals suspected of suffering from the disease and in this particular instance a Form B (withdrawal notice) was served with the endorsement that six gilts involved were not to be sold for six weeks.

Outbreak No. 2

At 7 a.m. a fat Shorthorn cow was found suffering from suspected pneumonia and was brought up to the buildings for examination. At 9.30 a.m. she was seen showing marked respiratory distress, periodic straining, profuse sweating, paddling of hind legs and nostrils pressed against manger. When released from the chain the cow plunged around the box to collapse on her side with the legs kicking violently and her whole body twitching in violent spasms.

Hypomagnesaemia was immediately suspected and a hurried intravenous injection of magnesium dextrose and calcium was made (with more than usual escape of blood from needle). The cow then sat up and appeared easier for a few minutes only to plunge forward in a final spasm and die. Again it was considered a common sequel to Hereford disease already encountered on this farm with similar deaths in which blood smears proved negative to anthrax. For this reason it was unfortunately presumed unnecessary to make a blood smear this time. However, an hour later an urgent message was received from the knacker's yard and the cause of death was very obviously anthrax.

At 4 p.m. the same day a yearling Hereford calf was found dead of anthrax and another was found with belly pain, and thin blood-stained faeces with an unrecordable temperature of 110° plus.

Treatment with 1,000,000 units crystalline penicillin initially, and repeated at 2, 12, 24 and 36 hours, proved effective, although the calf is now still unthrifty after some 12 weeks and subject to obscure digestive disturbances.

Two days later another calf was ill, with a temperature of 109°, but recovery was prompt and complete following the administration of 60 c.c. serum and 1,000,000 units penicillin.

Contaminated "linseed cubes"—an off-ration food tuff—was suspected as the origin of infection, although they have not been proved to be causative agents.

The sequel to this outbreak was that on the day after the death of the cow, six fatting pigs in the next box were ill with elevated temperatures and were treated with penicillin as possible anthrax cases. Later, it was proved to be erysipelas, by the appearance of typical diagnostic skin lesions.

REVIEW

[Manual of Infertility and Artificial Insemination in Cattle. By P. G. Millar and N. P. Ras. (1952). Pp. 329. Baillière, Tindall & Cox, 7–8, Henrietta Street, London, W.C.2. Price 25s.]

The authors of this publication have been courageous in their endeavours to present in pleasantly readable form a 300-page book devoted to bovine reproduction and closely associated subjects.

The book, dealing with male and female breeding problems, has quite rightly given space to a full description of the normal physiological functions before providing a methodical approach to breeding problems both in the male and female, as well as on a herd basis.

The chapter dealing in some considerable detail with male fertility shows that the authors have a practical appreciation of the topic, although the procedure of examination suggested may well be beyond the scope of the average busy veterinary surgeon. A complex subject, female reproductive failure, is covered methodically and little existing knowledge remains unquoted, and in most cases an endeavour has been made to suggest treatments. The authors, however, are not dogmatic in their recommendations when suggesting assistance for individual animals or for the herd breeding problems. It is unfortunate that the chapter enlarging the field of reproductive failure does not give data indicating the effectiveness of treatments suggested, but it is hardly fair to criticise, as due to lack of follow-up facilities this type of information is difficult to come by.

Those closely associated with animal breeding will be pleased to see that the authors have not neglected the part played by genetics; they go to some length to describe reproductive abnormalities associated with inheritance.

The last chapter of the book is devoted to a superficial review of artificial insemination, giving details of development and general Centre organisation, as well as latest developments in semen storage and dilution.

The value of the Manual to the student of infertility could have been enhanced by referencing others' work, but to the veterinary surgeon in practice the book should make refreshing reading.

ABSTRACTS

Utilisation of Offal and By-products of Food Animals*

The ideals for which Benjamin Ward Richardson worked have not yet been attained as far as our slaughtering establishments are concerned. Clean methods of production and distribution are more necessary in the case of edible unprocessed offals as they are more susceptible to contamination than carcases. Livers should not come into contact with the slaughterhouse floor, and offal containers should be kept clean and made of material capable of being sterilised. Offal is often placed in sacks, and put on the floor of lorries delivering carcase meat. It is doubtful whether blood from our abattoirs, particularly from the mass production line, is fit for human consumption. Although such blood may be heated before use, such heat does not kill spores. Precautions against the use of blood from diseased animals can only be taken with certainty when collected from individual cattle. In pigs, mass line-slaughtered, the bladder sphincter muscle may become relaxed whilst the blood is being collected from the animal, hanging head downwards on a rail.

Tripe should not be allowed to fall on the abattoir floor, and there is a good source of potential food lost in sheep tripes. Chitterlings should be cut open as in America, so that they can be cleansed thoroughly. Sheep heads are never cleaned after removal from the carcases, and stomach contents are frequently found therein. Dirty wool is also left on the heads.

Credit is given to the Ministry of Food for the collection of glandular products for pharmaceutical preparations, thanks to centralised slaughtering. Hides and skins, inedible blood, ingesta and faeces are all dealt with, and a new era is ready to open up in the utilisation of rumen contents for animal feeding, as the synthesis of vitamin B_{12}, and the associated animal protein factor, takes place in considerable quantities in the rumen. The use of reject meat and offals for pet feeding after sterilisation of the material is advocated.

Small "mutton" abattoirs are suggested to encourage rural communities and our hill farmers. If new marketing schemes are to come into force use should be made of the best technical knowledge available.

D. J. A.

* **The Hygienic and Economic Utilisation of Offal and By-products of Food Animals.** (The Benjamin Ward Richardson Lecture for 1952.) Bywater, H. E. (1953). *J. roy. San. Inst.* **73**. 33-45.

* * * * *

Carbon-dioxide Anaesthesia in Pig Slaughter*

At the Hormel plant, where pigs are killed at the rate of 1,000 per hour, a completely new method has been tried out to render the animals unconscious before bleeding. This consists in driving the pigs through a tunnel containing CO_2. The pigs are subjected to a moderate inhalation of CO_2 lasting for 45 to 50 seconds whilst they pass in single file through the tunnel. A conveyer belt carries the unconscious animal from the tunnel to the "sticker," and the pig is bled whilst still under the effect of the gas. The pig is said to be insensitive from 10 to 20 seconds after it emerges from the tunnel, and this is long enough to enable shackling and sticking to be completed.

The anaesthetic is said not to harm the animal, which will revert to a normal state of activity if not killed. So far, 300,000 pigs have been thus slaughtered without the loss of a carcase. There is no adverse effect upon the meat or meat products. Bleeding is more efficient than in the old system of hoisting and bleeding fully conscious pigs. The cost of the CO_2 works out at a fraction of a cent per pig.

The source of the CO_2 is dry ice placed in a 2-ton converter, where it is changed to the gaseous state. The Federal Meat Inspection Service Officers are satisfied that the method has no ill-effect on the meat or its suitability for subsequent processing.

D. J. A.

* **Carbon-dioxide Anaesthesia in the Slaughter of Hogs.** Swan, Edward R. (Editor: "The National Provisioner."). *J. Meat Packing Indust., U.S.A.* October 4th, 1952.

XVth INTERNATIONAL VETERINARY CONGRESS AT STOCKHOLM

Many enquiries have been received by the British Veterinary Association as to the possibility of a party or parties being organised for the International Congress to be held from August 9th to 15th. For the convenience of members we publish the following information regarding the travel facilities available through Messrs. Thomas Cook and Son.

XVth INTERNATIONAL VETERINARY CONGRESS
STOCKHOLM—AUGUST 9th to 15th, 1953

Thos. Cook & Son, Ltd., in their capacity of official Travel Agents for the British Delegation to the above Congress, have been instructed to issue this programme of travel arrangements.

ITINERARY No. 1—RAIL AND SEA

Outward			
Thurs., Aug. 6th	London (St. Pancras)	depart 15.30	
	Tilbury	arrive 16.30	
	"	depart 18.00	
Fri., Aug. 7th	At Sea		
Sat., Aug. 8th	Gothenburg (Londonpier)	arrive 06.00	
	" "	depart 07.30	approx.
	Luncheon in the Restaurant Car.		
	Stockholm (C)	arrive 15.00	
Homeward			
Sat., Aug. 15th	Stockholm (C)	depart 12.15	
	Luncheon in the Restaurant Car.		
	Gothenburg (Londonpier)	arrive 19.00	
	" "	depart 19.30	
Sun., Aug. 16th	At Sea		
Mon., Aug. 17th	Tilbury	arrive 06.45	
	"	depart 08.45	
	London (St. Pancras)	arrive 09.45	

Inclusive Charge.—£21 each person. Subject to a minimum of 15 persons travelling together throughout.

Optional Supplements:—

Second class on Steamers	£7 4 0
Second class in Sweden	£2 5 0
First class on Steamers (including first class London to Tilbury and return)	£10 16 0
Superior accommodation on Steamers *additional to first class supplement*	
(*a*) Single cabin, "C" deck	£6 6 0
(*b*) Inside single cabin "B" deck ...	£11 14 0
(*c*) Outside single or double cabin "B" deck	£15 6 0
(*d*) Berth in cabin de luxe with private bath, "A" deck	£18 0 0

Expense Vouchers may be purchased in advance, according to the class of travel, for use on board North Sea Steamers for the purpose of purchasing refreshments, cigarettes, etc. Their cost is not chargeable against the Basic Travel Allowance. Full particulars may be obtained at time of booking.

The Charge Includes:—

(1) Travel tickets London back to London in accordance with the Itinerary, third class throughout.
(2) Reserved seats on trains.
(3) Minimum rate berths and meals on North Sea steamers, *excluding gratuities.*
(4) Luncheon in the Restaurant Car between Gothenburg and Stockholm and vice versa, including gratuities.
(5) General services of Cook/Wagons-Lits Uniformed Representatives at all principal points *en route*.

ITINERARY No. 2—AIR

OUTWARD

Sat., Aug. 8th Depart London by Morning Tourist Flight for Stockholm.

HOMEWARD

Sat., Aug. 15th Depart Stockholm by morning Tourist Flight for London.

Inclusive Charge.—£45 each person. Subject to a minimum of 15 passengers travelling together throughout.

Providing: Tourist Air tickets from London to Stockholm and return.

Early Booking Essential.—Closing date for booking July 6th, 1953.

Deposit.—Bookings can be effected on payment of a deposit of £2 (by rail), or £3 (by air)—subject to the usual conditions which can be obtained from Cook's.

Passports.—Passengers must hold passports valid for the journey. Application forms and every assistance possible will be given at Cook's offices.

Meals/light refreshments are served on board the aircraft free of charge.

Airport and Road Transport Charges.—The authorities impose an airport service charge of 5s. per head on passengers embarking on international flights at London airports.

Additionally, the cost of road transport between Air Terminal and Airport and vice versa in London and Stockholm is not included in the fare and passengers wishing to use the airport coach service will be required to pay the charges locally.

The present charges are as follows: London 5s. in each direction. Stockholm Sw. Kr. 2 in each direction.

Note.—Quotations by other services, if required, will be quoted on request.

The above travel facilities apply to groups of 15 or more travelling together throughout and, under present arrangements, the number using these facilities will be known only to Cooks as and when the applications made through their branch offices are assembled at their head office in London. Members will travel independently, although they will be in groups according to their particular requirements; others, of course, may wish to make their own private arrangements.

However, if members would like a definite party or parties formed and require help not only with travel but also with hotel arrangements in Sweden, they should write to Mr. W. G. R. Oates, Secretary, Permanent U.K. National Committee, 10, Red Lion Square, London, W.C.1, stating their wishes. (All hotel arrangements have to be made through the Secretary, Congress Organising Committee, c/o A. Isaksson, State Veterinary Medical Institute, Stockholm 50, Sweden.) If sufficient members choose to travel by one type of route, *e.g.*, by first-class rail and sea, or by air, then assistance will be given in collaboration with the British Veterinary Association.

QUESTIONS IN PARLIAMENT

GIN TRAPS

Commander DONALDSON (February 17th) asked the Secretary of State for Scotland if he is aware of the public concern regarding the use of gin traps which cause unnecessary suffering both to rabbits and domestic animals; and what steps he is taking to introduce a more humane type of trap for use in Scotland.

Mr. SNADDEN: My right hon. Friend is aware of the public concern, but he cannot, in the interests of food production, prohibit the use of the gin trap until an effective, humane substitute is readily available. Eight inventors have submitted 17 models for consideration as alternatives to the gin. Of that number, one—the "Imbra"—has given encouraging results on field trial, and one—the Miller "Killmore"—has shown possibilities which may be developed in later models. My right hon. Friend is arranging for further trials of the "Imbra" and of any other available types in the spring.

Commander DONALDSON: Can my hon. Friend say whether, when his right hon. Friend has had sufficient time to test these new traps, he has the authority to enforce their use once they have been approved?

Mr. SNADDEN: Statutory powers exist under the Agriculture (Scotland) Act, 1948, enabling the Secretary of State for Scotland to do what the hon. and gallant Member is asking.

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DISEASED ANIMALS (CARCASES)

Mr. PETER FREEMAN (February 18th) asked the Minister of Food the numbers and types of animals that were found to be so diseased, either wholly or in part, as to be unfit for human consumption during last year; and what proportion in each case this represented.

Major LLOYD GEORGE: As the reply contains a number of figures, I will, with permission, circulate it in the *Official Report*.

Mr. FREEMAN: Can the right hon. and gallant Gentleman give the proportion by number of the animals as well as the proportion by weight?

Major LLOYD GEORGE: I would remind the hon. Gentleman that it took a very long time to provide the answer to this question. The proportion ranges from about 1·4 to under 1 per cent.

Following is the information:—

Figures for the year ended December 31st, 1952, are not yet available but for the year ended September 30th, 1952, the numbers of animals wholly condemned after slaughter were as follows:—

	Number of carcases wholly condemned	Percentage of total number of animals slaughtered
Cattle	33,383	1·41
Calves	21,273	1·71
Sheep and lambs ...	22,252	0·33
Pigs	24,441	0·43

Records are not yet available from all local authorities of the number of carcases of which parts only were condemned but we have records of the total weight of all meat condemned, including parts of carcases and the percentage this represents of the total weight of meat produced and slaughtered during the period was as follows:—

Cattle	1·43 per cent.
Calves	1·41 " "
Sheep and lambs	0·32 " "
Pigs (*a*)	0·55 " "

(*a*) Does not include condemnations of individual cuts of otherwise sound bacon pigs, records of which are not maintained.

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CALVES (SLAUGHTER)

Mr. E. JOHNSON (February 18th) asked the Minister of Food at how many markets held on Saturday calves are sold for slaughter; and for how long they are kept before being killed.

Major LLOYD GEORGE: Ten. The calves are slaughtered either on the same day or on the following day.

Mr. JOHNSON: Can the Minister say how it is possible to slaughter calves sold on a Saturday the same day or the following day, when so few slaughterhouses, if any, are open; and what arrangements

are made for the feeding of the calves until such time as they are slaughtered? Is he satisfied that these arrangements are adequate?

Major Lloyd George: If the hon. Gentleman has any instances where this is not satisfactory, I shall be happy to look into them.

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Foot-and-Mouth Disease, Wales

Mr. Llewellyn (February 19th) asked the Minister of Agriculture whether he will make a further statement about the incidence of foot-and-mouth disease in Wales.

Sir T. Dugdale: There have been 11 outbreaks of foot-and-mouth disease in Wales this month, nine in Glamorgan and two in Monmouthshire. One hundred and twelve cattle, 261 sheep and 63 pigs have been slaughtered. One of the outbreaks in Glamorgan was a primary outbreak, and eight others resulted from the local spread of the infection caused by the movement of pigs. Enquiries into the source of infection in the primary outbreak and the two remaining cases are continuing. The usual movement restrictions have been imposed around the infected premises and I hope that there will not be any spread of the disease.

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Pig Fattening (Penicillin and Aureomycin)

Mr. Dodds (February 19th) asked the Minister of Agriculture what progress has been made in permitting penicillin and aureomycin to be used in the diet for fattening pigs.

Sir T. Dugdale: The Therapeutic Substances (Prevention of Misuse) Bill, which provides for the amendment of the Penicillin Act, 1947, so as to give power to permit this practice, has received a second reading in another place.

Mr. Dodds: While famous experts on this matter have declared that more harm than good can be done in mixing these substances with animal feeding-stuffs, can users be assured that there will be no harmful effect so far as they are concerned?

Sir T. Dugdale: I think that is a different question from the one on the order paper but all these points will be borne in mind.

Mr. Hastings: Before considering this matter will the right hon. Gentleman be concerned to ensure that there is sufficient penicillin and aureomycin in this country for the needs of persons like ourselves?

Sir T. Dugdale: Yes, Sir, most certainly.

Colonel Gomme-Duncan: May I ask whether we have all gone mad to want to give penicillin to pigs to fatten them? Why not give them good food, as God meant them to have?

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Backyard Pigs (Removal of Restrictions)

Mr. Nabarro (February 23rd) asked the Minister of Food whether he would now relax and simplify the regulations governing rearing, fattening and slaughter of backyard pigs for owner consumption.

Dr. Charles Hill, Parliamentary Secretary, Ministry of Food: I am glad to say that we can now simplify the scheme. From March 1 registration will no longer be required, and a licence to slaughter will be issued on a simple declaration that the pig has been kept under the appropriate conditions for two months.

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Quarantine Premises (Inspection)

Lieut.-Colonel Lockwood (February 19th) asked the Minister of Agriculture to what extent regular inspections are carried out by his officers of approved quarantine kennels in order to ensure that they are kept up to the required standard; in how many cases it has been necessary to withdraw his approval of a place of detention within the last three years; and on what grounds.

Sir T. Dugdale: Premises approved for the detention of imported dogs and cats are inspected quarterly by my officers. It has not been necessary within the last three years to withdraw approval of a place of detention.

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Anthrax-infected Animals (Carcase Disposal)

Mr. G. Williams (February 20th) asked the Minister of Agriculture what method of destroying animals affected with anthrax is employed by his officials.

Sir T. Dugdale: Animals with anthrax are not required to be destroyed. Local authorities are responsible for the safe disposal of the carcases of animals which have died of anthrax, by burning, chemical treatment, or burying in lime.

NOTES AND NEWS

Diary of Events

March 4th.—Joint Meeting of the Midland Counties Division, B.V.A. and the Midland Medical Society, at Birmingham (Medical Institute) 8 p.m.

March 4th.—Meeting of the Association of Veterinary Teachers and Research Workers (Scottish Regional Group) in the Royal (Dick) School of Veterinary Studies, Edinburgh, 2.30 p.m.

March 5th.—Meeting of the Central Division, B.V.A., at the Royal Veterinary College, N.W.1, 6 p.m.

March 5th.—Annual General Meeting of the East Midlands Division, B.V.A., at Sutton Bonington, 2.15 p.m.

March 6th.—Meeting of the South Wales Division, B.V.A., at Carmarthen (Dolwar Café), 2 p.m.

March 6th.—Meeting of the Society of Practising Veterinary Surgeons, at Oxford (The Randolph Hotel), 2.30 p.m.

March 11th.—Meeting of the Editorial Executive, B.V.A., 2.30 p.m.

March 18th.—Meeting of the Section of Comparative Medicine, Royal Society of Medicine, at 1, Wimpole Street, W.1, 5 p.m.

March 19th.—V.V.B.F. (Northern Area): Dinner-Dance at the Northern Hotel, Aberdeen, 7.30 p.m.

March 19th.—Annual Dinner and Dance of the East Midlands Division, B.V.A., at Nottingham (The George Hotel). Reception 7 p.m.

March 25th.—Meeting of the Supplementary Register Division, B.V.A., at the Connaught Rooms, Great Queen Street, Kingsway, W.C.2, 2 p.m.

April 1st.—The Association of Veterinary Teachers and Research Workers: Joint meeting with the Northern Region, at the University of Liverpool Veterinary Field Station, Leahurst, Windle Hill, Neston, Wirral, Cheshire. Business, 10 a.m.; Symposium on "Skin Diseases," 11 a.m.

April 25th.—30th Annual General Meeting of the Association of State Veterinary Officers, in the Auditorium of the Wellcome Foundation, 183-193, Euston Road, N.W.1, 2 p.m.

B.V.A. Committee and Council Meetings in Edinburgh

At the Royal (Dick) School of Veterinary Studies.

Monday, April 20th.—11 a.m. Organising Committee.
2 p.m. Parliamentary and Public Relations Committee.
3.30 p.m. Home Appointments Committee.

Tuesday, April 21st.—10 a.m. Veterinary State Medicine Committee.
12 noon Finance Sub-committee.
2.15 p.m. General Purposes and Finance Committee.

Wednesday, April 22nd.—11 a.m. Council meeting.

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Docking and Nicking of Horses Act, 1949

Under the provisions of this Act, docking and nicking—the deliberate severing of any muscles or tendons in the tail of the horse—are forbidden absolutely, unless a veterinary surgeon, after examining a horse, has certified in writing that the operation is, in his opinion, necessary for the animal's health.

Despite the fact that the Act is now nearly two years old, yearlings and two-year-olds are being exhibited docked at many leading shows. Photographs of docked winners have appeared in the agricultural press and it is obvious that the provisions of the Act are being widely ignored.

The whole question is one of considerable importance to those in practice and we have felt it timely to bring it to notice before the next foaling season begins.

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SHOWS AND THE VICTORIA VETERINARY BENEVOLENT FUND

A Plea for Support

The Council is grateful to members who pass on to the Fund fees received for attendance at shows throughout the country. It is thought that this kindly action might be extended greatly, and

the suggestion is brought to the notice of members who are in a position to act accordingly.

In cases where veterinary attendance is honorary, most show committees are very willing to subscribe when the suggestion is put to them.

The wider adoption of these measures could be a considerable source of income, and thus enable the Fund to increase the scope of its assistance to those who, in these times of financial hardship, are in such dire need of the help the "Victoria" exists to provide.

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PERSONAL

Births.—COUPLAND.—On January 20th, 1953, to Rhoda, wife of Andrew M. T. Coupland, M.R.C.V.S., 13, N.W. Circus Place, Edinburgh, 3, a daughter—Alison.

DAVISON.—On February 14th, 1953, at West Bridgford, Notts, to Rita, wife of Frank L. Davison, M.R.C.V.S., a son—John Lawson, brother to Patricia.

POMPHREY.—On February 11th, 1953, at 47, Savile Road, Dewsbury, to May (*née* Donaldson), wife of A .M. Pomphrey, M.R.C.V.S., a son—Stuart William, brother for Anne.

RIMMER.—On February 11th, 1953, at Liverpool, to Beryl, wife of Bernard Rimmer, M.R.C.V.S., a son.

ROGERS.—On February 16th, 1953, to Audrey, wife of Michael J. H. Rogers, Amersham, a daughter—Helen Grace.

SINGLETON.—On February 17th, 1953, to Hilda, wife of W. Brian Singleton, M.R.C.V.S., a son—John Brian Neil.

STEVEN.—On February 9th, 1953, at Plovers, Westerham, to Shirley, wife of Henry John Steven, a sister for Jennifer—Hazel.

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Wills.—Mr. Stephen Ernest Sampson, M.R.C.V.S., of Hoyles Farm, Bradfield, near Sheffield, who died in December, 1951, left £4,556 (£4,460 net value).

Mr. Frank Haigh Sugden, M.R.C.V.S., of 21, Stanton Street, Grantham, who died on October 15th last, left £5,656 5s. 10d. gross; £5,496 4s. net value.

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School Holiday Exchange (Norway).—Professor Jon Teige, Norges Veterinaerhogskole, Ullevalsveine 72, Oslo, Norway, would like to hear from a veterinary surgeon in the British Isles interested in a holiday exchange for their sons.

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Mr. J. E. Lancaster's Assignment to FAO.—Mr. J. E. Lancaster, B.SC., M.R.C.V.S., of the Animal Health Poultry Research Station at Houghton, Hunts, has received an assignment from the Food and Agriculture Organisation to proceed to Thailand, where he will be engaged on poultry disease problems.

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R.C.V.S. OBITUARY

GOLDSMITH, William Woods, M.R.C.V.S., The Old Manor House, Norton, Letchworth, Herts, late of Hitchin, Herts. Graduated London, March 22nd, 1887. Died February 17th, 1953; aged 87 years.

KYNE, Joseph, M.R.C.V.S., of Renmore, Galway, Eire. Graduated Dublin, December 19th, 1924. Died February 13th, 1953.

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FOWL PEST

Poultry Industry Representatives Support Continuation of Ministry's Slaughter Policy

Representatives of the poultry industry have had a meeting with officials of the Ministry of Agriculture for a discussion and exchange of views on the fowl pest situation. The Ministry's Chief Veterinary Officer, Mr. Ritchie, in outlining recent developments, struck a note of cautious optimism when he said that the decline in the number of outbreaks in the last few weeks was a measure of the success of the Ministry's policy for controlling the disease. Explaining the necessity for continuing the present slaughter policy Mr. Ritchie emphasised that if that policy were once abandoned the disease would become endemic in this country. The economic loss to the poultry industry would be incomparably greater than at present and vaccination would not provide a satisfactory alternative, although it might be the only choice in countries where the disease was widespread and endemic. While fowl pest vaccine was known to be reasonably effective there was evidence that vaccination might in some cases result in stimulating other dormant infections. If vaccination were adopted the slaughter policy would have to be dropped and complete reliance placed on vaccination for controlling the disease.

There ensued a lengthy discussion on the many questions which had recently figured prominently in the Press. In the light of this discussion the meeting was of the unanimous opinion that the present slaughter policy was the most effective way of controlling the disease and that to abandon it would be a disaster for the poultry industry. There were occasions, depending entirely on the circumstances of the case, where it was practicable to restrict slaughter to only a portion of a flock, but owing to the highly infectious nature of the disease such cases had to be very carefully selected and were not invariably successful. It was explained that the danger of infection being introduced in imported poultry had been virtually removed by the present import restrictions. Such imports as were now permitted under licence were subject to very strict safeguards, including the testing of samples on arrival in this country. None of the samples so far taken had been found to be infected. The greatest source of infection had therefore been removed. Continuing outbreaks, however, suggested the possibility that pockets of infection existed in this country, particularly in East Anglia and Lancashire. The Ministry was accordingly proposing to undertake a survey in order to assess the extent of undisclosed infection present in the country.

On the question of the reporting of suspected cases, there had been some instances of undue delay, but on the whole reporting was satisfactory and reasonably prompt.

Attention was drawn to the dangers inherent in the present lay-out of some of the larger commercial premises where hatching and rearing took place in close proximity; in their own and the national interest, poultry breeders should do all they could to conduct these operations on separate premises in order to lessen the danger of the disease.

There was a further general discussion in the course of which a number of useful suggestions were made. The meeting closed with an expression of confidence in the Ministry's measures for combating the disease in the knowledge that research work was continuing and that the Ministry intended to start its survey in the near future.

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FOOT-AND-MOUTH DISEASE ON THE CONTINENT

Early in the month the Director of Veterinary Services at Helsinki reported to the Office International des Epizooties an outbreak of foot-and-mouth disease on one farm in Finland: no further outbreaks have occurred in this new area. Elsewhere on the Continent the number of newly infected premises ranges from 20 to 40 a week in Belgium and Denmark to 500 a week in France and Germany.

Britain Withdraws Channel Island Import Restrictions

Following outbreaks of foot-and-mouth disease in the Channel Islands an order was made on December 10th, 1952, prohibiting the landing in Great Britain of animals and hay and straw from those islands. As the islands have been free from the disease for some weeks past, these importation restrictions have been withdrawn.

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ASSOCIATION OF VETERINARY STUDENTS

Tenth Annual Conference in London

The tenth annual conference of the Association of Veterinary Students was held from January 29th to February 1st at the Royal Veterinary College, London, N.W.1, by kind permission of the Principal, Professor J. B. Buxton. Delegations of students came from the seven veterinary schools of the British Isles, while the presence of veterinary students from Norway, Finland, France, Switzerland and Western Germany gave an international flavour to the conference. The programme included the reading of a student paper, talks by members of the veterinary profession on subjects of particular interest to students and an exhibition of veterinary instruments and drugs provided by a number of well-known manufacturers. Sports fixtures included rugger, soccer, hockey, boxing, shooting and table tennis, in all of which the London teams successfully overcame their opponents. The major social event of the conference was the dance held on Friday evening; on Saturday there was a "smoker" for men, while the women students organised a theatre party.

The Association was welcomed to the Royal Veterinary College by Professor Buxton, who officially opened the conference. The opening was followed by the reading of a paper by Mr. B. Fell (a member of UFAW) on: "The Veterinary Surgeon and the Animal Welfare Society. This paper was obviously the result of much careful investigation and was followed by a lively discussion. On Saturday morning the Association heard Dr. W. R. Wooldridge, M.SC., M.R.C.V.S., F.R.I.C., who gave a very interesting talk on the opportunities for research which exist, at the present time, in the veterinary profession. He was followed by Mr. S. F. J. Hodgman, M.R.C.V.S., and Mr. A. J. Wright M.R.C.V.S., who explained the organisation and functions of the British Veterinary Association, and impressed upon all students the necessity of joining this association as soon as possible after qualifying.

Sports trophies were presented to the captains of the winning teams on Sunday afternoon. The presentations were made by Professor G. H. Wooldridge, F.R.C.V.S., M.R.I.A., who represented both the R.C.V.S. and the B.V.A. The presentations were followed by the

annual general meeting of the Association at which the retiring President, Mr. J. D. E. Wright, of Bristol, introduced the new President, Mr. A. R. Akester, of Cambridge.

Altogether this conference proved to be one of the most successful in the history of the Association, this being largely due to the excellent organisation of Miss Heather Vinnycomb. Its chief value lies in the fact that it enables students of the various colleges to meet together, to exchange ideas and to form friendships, all of which must surely prove of great benefit in later years.

The eleventh annual conference is to be held at Bristol, at which college the executive of the Association is now situated.

J. S.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

ANTHRAX:

Cambs.—Fodder Fen Farm, Manea, March (Feb. 18th).

Ches.—Carter's Green Farm, Weston, Crewe (Feb. 16th); Desley Heath Farm, Little Leigh, Northwich (Feb. 18th).

Dumbartonshire.—Tullichewan Home Farm, Balloch, Alexandria (Feb. 16th).

Hants.—Manor Farm, Bloswood Lane, Whitchurch (Feb. 16th).

Lancs.—Fordstone Farm, Preesall, Fleetwood (Feb. 18th).

Wilts.—Hebden Farm, Luckington, Chippenham (Feb. 17th).

Yorks.—Jessop Fold Farm, Honley, Huddersfield (Feb. 19th).

FOOT-AND-MOUTH DISEASE:

Kent.—Chislet Court, Chislet, Canterbury (Feb. 23rd).

FOWL PEST:

Essex.—Hill Crest, London Road, and Wyvern Poultry Farm, Stanway, Colchester (Feb. 16th).

Lancs.—Oaktree Avenue, Ingol, Preston (Feb. 17th).

Norfolk.—Turnpike Farm, Horsford, Norwich (Feb. 16th).

Sussex.—Blackdown Farm, Broadoak, Heathfield (Feb. 19th).

SWINE FEVER:

Berks.—Northbury Farm, Twyford, and No. 3 Field, Floral Mile, Twyford, Reading (Feb. 16th).

Cambs.—Manor Farm, Fowlmere, Royston, Herts (Feb. 16th).

Ches.—High Ash, Tushingham, Malpas (Feb. 18th); The Hayes, Church Street, Malpas (Feb. 19th).

Cornwall.—West Polmear Farm, Charlestown, St. Austell (Feb. 18th); Chendale Rose, Carharrack, and Lannarth Farm, Lanner, Redruth; Bohortha, St. Anthony, Truro, Cornwall (Feb. 19th); Trelowth Farm, Pool, Redruth (Feb. 20th).

Denbighs.—Penybont, Marli, Abergele (Feb. 16th).

Essex.—Wyldberry, Fox Street, Ardleigh, Colchester; Hill House Farm, Great Yeldham, Halstead (Feb. 16th); Church Farm, Stebbing, and "Creedy," Little Dunmow, Chelmsford (Feb. 18th); Jacketts Farm, Danbury, Chelmsford (Feb. 20th).

Glam.—Tyn-y-Crom Farm, Pencoed, Bridgend (Feb. 16th).

Lancs.—Brooklands, Halton, Lancaster (Feb. 16th); Higher Green Farm, Alkrington, nr. Middleton, Manchester (Feb. 18th); Gerard Hall, Haighton, Grimsargh, Preston (Feb. 19th).

Lincs.—Moortown Road, Nettleton, Lincoln (Feb. 18th); Manure Works, Marsh Chapel, Grimsby; Seymour's Yard, West Street, Alford (Feb. 19th).

Middlesex.—Yeading House, Willow Tree Lane, Yeading, Hayes (Feb. 17th).

Norfolk.—Penhill Farm, Great Ellingham, Attleborough (Feb. 16th).

Rutland.—Wingwell House, Wing, Oakham (Feb. 16th).

Staffs.—Cemetery Gardens, Great Brickiln Street, Wolverhampton (Feb. 17th).

Suffolk.—Colston Hall, Baddingham, Woodbridge (Feb. 16th).

Surrey.—48, Beddington Lane, Beddington (Feb. 17th).

Sussex.—Rowhook Manor Estate, Slinfold, Horsham (Feb. 21st).

Warwicks.—Faulkwood House, The Common, Corley Moor (Feb. 16th); Musson Hall, Fillongley, Coventry (Feb. 17th).

Yorks.—Easby Firs, Great Ayton, Middlesbrough; Thurston's Farm, Diggle (Feb. 16th); "Four Acre," Cowley Lane, Holmesfield, Sheffield (Feb. 17th); Scalpay Cottage, Sutton, Thirsk; Moverlay House, Church Balk Lane, Pontefract (Feb. 19th); West Lodge, Kirkleatham, Redcar (Feb. 20th).

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THE BRITISH HORSE SOCIETY

At the annual meeting of the British Horse Society, held in London on February 17th, the fifth annual report showed a steady growth in membership over the five years to 5,558, the associated societies and horse shows numbering 267. Lieut.-Colonel V. D. S. Williams was elected President for the ensuing year in succession to Lieut.-Colonel G. C. Cubitt. The President-Elect for 1954 is Lord Irwin. Colonel Williams, who has always actively encouraged all forms of equitation, was the first Englishman to be invited to judge in the Olympic Games, which he did at Helsinki last year. Colonel Cubitt has been active in the development of the combined training tests in England, but his greatest achievement has been the success of the Pony Club, which has nearly 20,000 members and provides a constant flow of young horsemen and horsewomen.

The Society has to its credit a fine series of achievements in the legislative field, in the promotion of a riding club scheme, the conduct of examinations, etc., and the encouragement of breed organisations. One of its chief concerns is to build up anew the Equestrian Olympic Fund to ensure that progress is maintained. There will be 12 events in combined training in 1953, the chief of which are Badminton, which is the only international event this year, and Harewood.

The International Horse Show at the White City has shown a substantial profit for the last two years and this summer we shall see classic equitation by the Spanish School of Vienna on their famous grey Lippizzaners. Britain has advanced to the forefront since the war and, provided that sufficient funds are available, will soon stand supreme, as our horses are acknowledged to be. The Queen has been a generous subscriber to the international fund and adequate funds should be obtainable to enable our teams to compete abroad.

The *Horse and Hound* ball to be held at Grosvenor House on March 19th will devote its profits to the British Olympic Equestrian Fund and to the Hunters' Improvement Society.

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CALL FOR IMPROVEMENT IN SLAUGHTERHOUSE METHODS

In a recent address to the Institute of Meat, Mr. H. E. Bywater, M.R.C.V.S., Chief Veterinary Officer for West Ham, took the opportunity of suggesting to the National College of Food Technology, where the meeting was held, that a useful function of the college would be to carry out research, of a practical nature, to improve slaughtering methods. Referring to the vast improvement that had come about nationally in the production of clean milk following the Milk and Dairies Order of 1926, Mr. Bywater said that to-day we needed slaughtering regulations that would prohibit antiquated conditions and practices that made for dirty meat production. The fact that the milk producer and retailer had become "clean milk minded" was in no small measure due to standards related to the bacterial content of the milk and the frequent sampling to determine the milk's germ content. A similar standard might be laid down for fresh meat and local authorities might make a habit of having meat examined for bacterial contamination.

In its report of the address, *The Meat Trades Journal* states that Mr. Bywater expressed the opinion that slaughtering technique had deteriorated since 1939, up to which time it had been carried out in two categories—the private slaughterhouse and the public abattoir. In his view the best meat had been produced by the private slaughterer-retailer, because a man who bought his own beasts would be reasonably sure not to waste the money he had invested. Following the outbreak of war the Ministry of Food took over the responsibility for slaughtering with the labour then available and the standard had since slipped back to the lowest 1939 level. The position was further aggravated by rush periods and peak kills, often bringing standards down to a quite alarmingly low level. To-day pride of workmanship was urgently needed among the slaughtermen.

Mr. Bywater pointed out that in spite of his previous remarks about the high quality of meat produced in private slaughterhouses he was not in favour of their return. In the interest of public health it was far more satisfactory to have public slaughterhouses, large enough to employ a whole-time meat inspector. Inspection could not be carried out efficiently if there were dozens of small slaughterhouses to be covered. He urged that offals and guts should never be allowed to fall on to the slaughtering floor but should be dropped into metal trucks for removal from the site. Offals should be hung up immediately on clean hooks or clean racks made of wire netting so that they could dry. Just how many dirty hooks were stuck into the average liver appeared to be nobody's business. Edible fat should not be flung on to the floor but placed on metal benches or racks to cool.

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MOREDUN INSTITUTE EXTENSION FOR PARASITOLOGICAL RESEARCH

In its issue of February 14th, *The Scotsman* announced that one of the most up-to-date units in Britain for research into tick and other parasites which infest animals is to be built by the Animal Diseases Research Association at the Moredun Institute, Edinburgh. It is expected to be in operation by the end of the year, staffed by a research team to be headed by Dr. Allan Campbell, at present on the staff of the Moredun Institute. Among several parasitic infestations which will be investigated are sheep tick, sheep blowfly and cattle warble, as well as the big problem of worm infestation of farm

animals. The new unit, a single-storey building in tasteful design, will have 10 laboratories. Edinburgh Dean of Guild Court has granted a warrant for its erection and that of a refectory for the institute staff at a total cost of £26,000.

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SCOTTISH POULTRY ADVISORY COMMITTEE RE-APPOINTED

The Scottish Poultry Advisory Committee, set up to advise the Secretary of State on matters relating to the poultry industry in Scotland, and particularly on the existing poultry improvement schemes and any further developments designed to improve the health and quality of poultry in Scotland, has been re-appointed for a further period of three years.

Members are: Colonel E. W. S. Balfour, Messrs. J. B. V. Cummings, T. Haining, W. Hunter, W. K. Leggat, Maitland Mackie, Mrs. H. Melville, Messrs. T. Milne, H. Morison, C. A. Munro, A. G. Norrie, J. G. Penny, G. H. Tarbolton, Dr. R. S. Chalmers Watson, Sir G. Wilson, and Mr. D. P. Wright.

Assessors to the Committee are Mr. D. S. Barbour, M.R.C.V.S.; Dr. A. W. Greenwood, Miss M. M. MacLeod, and Mr. T. E. Whittle. Chairman is Mr. L. G. Davidson, an Under Secretary of the Department of Agriculture.

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STALLIONS LICENSED IN SCOTLAND

The number of applications for licences for stallions in Scotland for the year ending September 30th last was 49. Of these two (both Clydesdales) were rejected, two were withdrawn and the balance of 45 were granted to the following breeds:—

	Appl. received	Licences issued	Annual exam. No. of stallions*
Clydesdale	28	24	86
Highland	8	8	31
Shetland	7	7	35
Hackney	—	—	16
Arab	1	1	8
Welsh	1	1	1
Exmoor	—	—	1
Percheron	—	—	4
Thoroughbred	1	1	2
New Forest	1	1	—
Non-pedigree	2	2	13
Total ...	49	45	197

* There were three revocations of licences already in force.

A further statement issued by the Department of Agriculture gives the number of licences refused during the past 10 years for various diseases or type faults. The refusals numbered: 1943, 5; 1944, 5; 1945, 7; 1946, 4; 1947, 9; 1948, 1; 1949, 8; 1950, 2; 1951, 0; 1952, 2.

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LEGAL NOTES

£150 Fine for Unauthorised Slaughter.—At Kingston Magistrates' Court, on February 2nd, a Cobham dairy farmer, Henry William Hemus, of Cold Norton Farm, Hatchford, pleaded guilty to slaughtering a cow for human consumption without the authority of the Ministry of Food. He was fined £150 and ordered to pay £25 costs.

In its report of the case *The Surrey Comet* states that Mr. B. M. Stephenson, who prosecuted, said that, except under licence, livestock should not be slaughtered for human consumption: slaughtering was deemed to be for human consumption unless otherwise proved. On December 11th inspectors of the Ministry of Food went to Cold Norton Farm and as soon as Hemus saw them he said, "You will find what you are looking for in here." In a barn, fitted up exactly like a slaughterhouse, were two hinds and two fores of beef, with a quantity of offal and a hide. When asked for an explanation Hemus said the cow was slaughtered because he found it "blown."

Evidence was given by Mr. Andrew C. Hume, veterinary surgeon, of Hanger Hill, Weybridge, who examined parts of the carcase. He stated that he could find nothing necessitating the immediate slaughter of the beast for humanitarian reasons.

In answer to Mr. Stuart Horner (for the defence), Mr. Hume said he could not detect from his examination whether the animal had been "blown" earlier in the day.

Mr. Horner said the trouble known as "blown" was caused when an animal had eaten more than it should, in this case kale. Hemus had found this cow, which had been in a kale field, very "blown" on December 10th. He telephoned a friend and, acting on his advice, gave the cow a drink. The next morning he found the cow down and regarded its condition as very serious. He thought that it would be better for the cow to be killed there instead of going to a knackers' yard as the carcase could then be used for human consumption. He got his friend to help him put the animal out of its pain.

Notice of the slaughter had to be given within 24 hours or the carcase delivered to the nearest slaughterhouse, or, if notice of the slaughter had been given, it should not be disposed of unless instructions had been given. Hemus did not know that rule. He had given his friend some of the offal for pig food and was intending to ask his own veterinary surgeon for advice, but the inspectors arrived before that could be done. By taking prompt action the carcase was saved for human consumption, so that the public lost nothing.

With reference to an allegation that he had been seen delivering in Bookham, Mr. Horner said a friend and a brother both had the use of Hemus' van and his brother ran a dog's meat shop.

"Are you suggesting that all these arrangements were made for the slaughter of this particular animal?" asked Mr. F. L. McGhee (Chairman).

Mr. Horner said the utensils were brought for the purpose by the friend. It all looked very professional but all the materials for occasions of this kind were to be found at any farm.

Mr. Stephenson said the carcase weighed 654 lb. and the retail value of the meat was £59 2s. 9d.

When a plea was made for time to pay the fine, the Chairman said the magistrates were not anxious to give any time, but one month was allowed.

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Self-Service Sale of Drugs.—The Court of Appeal (Lord Justice Somervell, Lord Justice Birkett and Lord Justice Romer) dismissed an appeal by the Pharmaceutical Society of Great Britain from a decision of the Lord Chief Justice [1952] that a self-service system of selling drugs installed by Boots Cash Chemist (Southern) Ltd. in an Edgware shop did not contravene section 18 (1) (*a*) (iii) of the Pharmacy and Poisons Act, 1933, which required the sale of such drugs to be under the supervision of a qualified chemist.

Customers leaving the shop had to pass the scrutiny of a qualified pharmacist stationed near the cashier's till, but the Society contended that a sale was complete so soon as a customer picked up what he was buying from shelves on which the drugs, marked with their price, were exposed for sale. It was held that the contract of sale was completed only when the purchase price was paid.

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ULSTER'S PROGRESS UNDER NEW "SAFE MILK" CODE

In its current issue, *Ulster Commentary* quotes a Ministry of Agriculture (N.I.) report as stating that under Northern Ireland's new code governing the production and handling of milk good progress has been made in "the drive for safe milk." At the end of August, 1952, all Grade B licences lapsed, and, except in a few small areas of limited supply, the only milk now available to the public is Grade A (tuberculin tested), produced from cows which have passed tests for freedom from tuberculosis, bottled on the farm and pasteurised. Virtually all the milk sold in Northern Ireland for human consumption is now within the safe milk scheme. Consumption of Grade A (T.T.) milk has risen by nearly 50 per cent. compared with October, 1951.

The following figures of milk sold for human consumption show the position in October, 1951, and the corresponding month of 1952:—

	1951 Gallons	1952 Gallons
Gross total	3,281,868	3,112,644
Grade A (T.T.) ...	193,955	273,431
Pasteurised	2,869,092	2,835,453
Raw	218,821	3,760

Note: The "raw" figure for October, 1951, includes Grade B milk.

A large number of advisory visits to milk producers have been made by veterinary officers and farm advisory officers, emphasis being laid on the provision of byre and dairy premises and a water supply conforming to the regulations and on the maintenance of clean and hygienic conditions of production and handling.

National Farmers' Union Annual Dinner

SPEECH BY THE PRIME MINISTER

This year's annual dinner of the National Farmers' Union, held in London last week, with the President, Sir James Turner, in the chair, was indeed an historic occasion, honoured as it was with the presence, as the chief guest, of the Prime Minister who, in a memorable speech, assured the agricultural industry that it was the policy of the Government to make British farming stable, but free from rigid confines inimical to progress. The attendance of more than 1,000 included a number of members of the veterinary profession, and amongst the guests were the President of the British Veterinary Association, Mr. A. M. Graham; the Chief Veterinary Officer, Mr. J. N. Ritchie; Mr. George N. Gould and Dr. W. R. Wooldridge.

Mr. Winston Churchill, who was given a tremendous ovation, many times revealed that mastery of eloquence exactly suited to the occasion: "The earth is a generous mother. She has provided in plentiful abundance food for all her children, if they will cultivate her soil in justice and in peace." He also spoke plainly as a farmer to farmers on practical issues with the right emphasis on encouragement, as in the following passages:—

"We shall back you in your efforts to make the fullest use of every acre and we shall share in your pride of achievement as British agriculture shows the world what the land can give forth in this scientific age."

"We must have a live and healthy market, and it must be supported by practical arrangements which ensure fair returns to the producer."

"There is no question of choosing between food production and exports. We must have both at the highest level, driven forward with fierce energy. But we are resolved to proclaim that the home-grown food of Britain must, with great urgency, be raised by 1956 to 60 per cent. above what it was before the war.

"That is a conviction which all political parties share and all Britons are determined to sustain. We have already raised it by more than 40 per cent. The job must be finished and finished soon. That is by no means the end."

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HARRY STEELE-BODGER MEMORIAL FUND

Sixth List of Donations

The Appeal Committee again acknowledges with grateful thanks the following further donations to the Fund:—

	£	s.	d.
Total announced on February 14th	2,289	15	10
Mr. and Mrs. F. G. Alexander (Honiton)	2	2	0
Mr. B. Bagenal (Narok, Kenya)	1	1	0
Mr. T. V. Bagshaw and Mr. J. A. Lee (Uttoxeter) ...	5	5	0
Mr. W. G. Beaton (Kikuyu, Kenya)	2	2	0
Mr. H. Bell (Maidenhead)	3	3	0
Mr. G. R. Benbow, Mr. W. H. Carr, Mr. H. Hayes and Mr. J. E. Johnson (Leicester)	5	5	0
Messrs. Albert E. Clarke & Son (Tamworth)	2	2	0
Mr. J. L. Cormack (Keresley)	2	2	0
Mr. H. E. Cross (Goffs Oak)	1	1	0
Sir Thomas Dalling (Rome)	10	10	0
Mr. J. L. Dalrymple (Salisbury, S. Rhodesia)	10	10	0
Sir Weldon Dalrymple-Champneys	5	0	0
Mr. W. S. Davison (Birmingham)	1	1	0
Mrs. E. Faux (Wadhurst)	1	1	0
Mr. I. A. Gibson (Cambridge)	1	0	0
Mr. R. A. Gilmore (Kircubbin)	2	2	0
Glaxo Laboratories Ltd.	26	5	0
Mr. L. St. Bel Golledge and Mr. R. A. Brown (Sherbourne)	10	10	0
Mr. A. Greig (Bucksburn)	2	2	0
Mr. W. J. Harrison (Southampton)	1	1	0
Mr. J. N. M. Hills (Builth Wells)	1	1	0
Mr. D. K. Hunt (Lymington)	1	1	0
Imperial Chemical (Pharmaceuticals) Ltd.	26	5	0
Mr. A. L. Lambert (Spalding)	1	1	0
Miss E. Langman (Yeovil)	5	0	0
Mr. P. L. Leslie (Acle, nr. Norwich)	1	0	0
Lymington Growmore Club	2	2	0
Mr. R. P. Morgan and Mr. W. J. Daniel (Ross-on-Wye)	2	2	0
Mr. R. M. S. Neave (Mombasa)	1	0	0
Mr. D. S. S. Nicholson (Wells)	2	2	0
North of Scotland Division	21	0	0
Mr. C. M. Peatt (Clevedon)	2	2	0
Penrith Agricultural Society	5	5	0
Penrith Farmers' Ball Committee	5	0	0
Miss L. H. Phillips (Haslemere)	1	1	0
Mr. N. R. Reid (Carshalton Beeches)	1	1	0
Mrs. R. M. Rose (Sherbourne)	5	5	0
Mr. M. I. Searle (Chipping Sodbury)	1	0	0
Mr. T. S. Skinner and Mr. C. M. Ferguson (Kirkcaldy)	2	2	0
Mr. J. Smith (Woldingham)	1	1	0
Mr. J. Smith (Writtle, nr. Chelmsford)	1	1	0
Mr. K. Stuart (Haywards Heath)	3	3	0
The Daventry Farmers' Discussion Club	5	0	0
Mr. P. Thrale (Epsom)	5	0	0
University and V.I.O. Staffs—Langford and Bristol ...	5	17	3
Mr. A. H. Watson, Mr. A. J. Adams and Mr. D. C. Smith (Bradford)	2	2	0
Mr. J. Watson (Penrith)	1	1	0
Mr. S. G. Wilson (Bishop Auckland)	2	2	0
Mr. G. Wyse (Oswestry)	3	3	0
Total	£2,501	1	1

All donations should be sent to the Hon. Treasurer of the Fund: S. L. Hignett, Steele-Bodger Memorial Fund, 36, Gordon Square, London, W.C.1, and cheques, postal orders, etc., should be made payable to the "Steele-Bodger Memorial Fund."

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Silicone in Blood Transfusion.—Mr. W. F. H. Jarrett, M.R.C.V.S., of the Veterinary Hospital, University of Glasgow Veterinary School, writes: "In your issue of July 19th, 1952, I published a note on the advantages of using silicone in blood transfusion in domestic animals. The silicone recommended is no longer available, but an identical product is now marketed by I.C.I. as Silicone M 441 and has proved equally satisfactory in use."

* * * * *

A three-year-old Clun Forest ewe belonging to Mr. W. P. Williams, of Old Court, Brobury, Herefordshire, has produced quintuplet lambs. Last year it produced triplets and in 1951 twins.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

CONTAGIOUS BOVINE PLEUROPNEUMONIA VACCINE

Sir,—Sheriff & Piercy have recorded in this journal some preliminary observations on the passaging of *Asterococcus bovis*, the causal organism of contagious bovine pleuropneumonia, in egg embryos, with a view to using this technique for vaccine production (Sheriff & Piercy, 1952). Vaccines in present use are cultures in serum broth of the organism attenuated by serial culture.

The following criticisms and observations are prompted by experience and work here.

(*a*) The use of penicillin in this work is briefly noted on "some occasions . . . to control contamination." No reference is made to published work from this laboratory (White, 1952). Further work is at present nearing completion here to provide evidence for the satisfactory use of penicillin in the production of contagious bovine pleuropneumonia vaccine. Sheriff & Piercy do not appear to have persisted with penicillin, although evidence of trouble with contamination appears later in their text.

(*b*) The use of the expression "Avianised" at this stage may be open to objection. The organism *A. bovis* can only be cultured if an essential substance, not so far precisely defined, is present in the culture medium. Serum is the usual source of this essential substance, and heat stable fractions have been obtained which support growth (Smith & Morton, 1951; Priestley & White, 1952). Evidence exists to suggest that this essential substance is also present in egg protein (Edward & Fitzgerald, 1951), and unpublished observations in this laboratory using Dorset's Egg medium support this strongly. Priestley, in a Report on Contagious Bovine Pleuropneumonia Research in this laboratory, which was circulated to African colonial territories in 1952, quotes unpublished observation of probable growth in infertile eggs made by Purchase in Kenya.

It would seem likely that the main reason why inspissated egg media have not received more consideration in the past is that *A. bovis* grows very poorly, and most irregularly on solid media, unless such media are very sloppy.

The possibility, therefore, that the egg passages reported by Sheriff & Piercy may be open to interpretation as successive culture attenuation, carried out in eggs, instead of in serum broth as is normally done, has to be borne in mind. The use of the word "Avianised" rather imputes the adaptation of the parasite to an abnormal host, but this would be difficult to establish unless, for example, hatched chicks which have absorbed their yolk-sacs could be infected.

(*c*) One strain of *A. bovis*, named "T1," was used by Sheriff & Piercy throughout. It is noted by them that "there is a possibility that strain T1 was initially avirulent, though the prolonged storage of the lymph may have been responsible for its apparent lack of potency." If the strain used started off by being avirulent, it is difficult to assess from this how far egg passages would firmly attenuate (modify) initially virulent strains in the same way, so as to render their use in cattle "safe." The lack of untoward reactions in cattle claimed by Sheriff & Piercy with their 30th and onwards egg passages has to be related to the behaviour of their strain in cattle before it had been attenuated.

A direct comparison between modification by serial passage in (*a*), serum broth, and (*b*), egg embryo, of the same strain of *A. bovis* would also be of great interest.

(*d*) It is stated by Sheriff & Piercy, under the initial description of Series 11, Growth in Embryonated Eggs, that "checks on dead embryos for the presence of C.B.P.P. organisms, and the absence of bacterial contaminants were made on several occasions." It would be of interest to know how this was done, and particularly, supposing stained films to have been examined, to obtain any information regarding the value, if any, of the stain Stevenel Blue (Priestley, 1952) used on egg cultures. This stain is of great value with serum broth cultures.

(*e*) The demonstration of antibodies was carried out by Sheriff & Piercy using the complement-fixation test. Recorded work with this test indicates that it is of limited value in *A. bovis* infection (Henning, 1949; Priestley, 1951). A slide flocculation test was developed here by Priestley (1951); from his published results, and from considerable use since, this test would appear to spot a very high proportion of infected animals. The results are not quantitative in the way that complement-fixation test results are, but the flocculation test is much simpler to apply.

The use of either test on Sheriff & Piercy's cattle before these were taken into experiments would have reduced very considerably the incidence of unsatisfactory results which they record, particularly with animals used as controls in challenge tests. These results are probably due to the use of immune, or partially immune, or even of infected, animals, as is noted in the case of bovine 1137.

(*f*) In their Discussion, Sheriff & Piercy have noted the unexpected results obtained in their titration of the 31st egg passage, possibly referable to interpolated subcultures in serum broth. The "unexpected variations in virulence" in serum broth culture vaccines, however, can occur when a great number of culture generations have been passed through, and after safe use of preceding generations of the same culture of the same strain, in the same medium, for considerable periods.

The fact that these variations have been particularly noted with strains in later stages of modification, *i.e.*, attenuated to a "safe" level, may be because similar use and observations of strains in the early stages of attenuation are not normally made on any scale for obvious reasons.

It is suggested that until the underlying causes of the late resurgences of virulence of previously safe cultures of *A. bovis* are more fully understood, it is difficult to assess from limited experiment the safety of alternative methods of modification (attenuation) such as may be represented, for instance, by egg passage. It may be noted that such late resurgences in virulence may not be observed until as long as a year of continued safe use of a culture vaccine has passed.

We believe that a re-examination of the evidence put forward for the existence of a morphological cycle in the growth of *A. bovis* and related organisms (Klieneberger, 1934; Turner, 1935; Wilson & Miles, 1945), and a consideration of possible relationships within such a growth cycle, if it exists, to stages of virulence, is worth while. Work on these lines might lead to a better understanding of the problem. Concurrent with this is needed a fresh search for a method of obtaining a regular and reproducible response with *A. bovis* in a suitable small experimental animal.

The foregoing observations are not intended, and it is hoped cannot be construed, as in any way attempting to minimise the value of work on the lines carried out by Sheriff & Piercy. The question of a safe and effective vaccine against contagious bovine pleuropneumonia is of such paramount importance to-day in all territories where the disease exists, that critical attention is necessarily focused on any work directed to this end.—Yours faithfully, E. N. Dafaalla; R. W. White, Sudan Veterinary Service, Veterinary Research Laboratory, Khartoum, Sudan.

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PROPOSED AMENDMENTS TO THE PENICILLIN ACT

Antibiotics in Animal Feeding-stuffs

Sir,—In spite of the fact that any antibiotic present in the blood stream following the feeding of pigs with meals containing such substances is so small as to defy chemical detection, it has been stated by at least one bacon curer that even this trace will interfere with curing—presumably because the antibiotic inhibits nitrite formation which is a normal and important feature of certain of the bacteria present in the brine used for curing purposes.

It should be understood, however, that at least in the case of pigs receiving "Aurofac" (or any other aureomycin supplement) the very small amount of aureomycin which may circulate in the blood stream is excreted from the body so rapidly that it would only be necessary for the farmer to stop feeding his supplement 48 hours before death in order to clear the pig's tissues of all antibiotic.—Yours faithfully, W. P. Blount, The British Oil & Cake Mills, Ltd. 2, Kingscote Street, London, E.C.4. *February 13th*, 1953.

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Sir,—I am at variance with Mr. Grattan regarding one or two points in his letter of the 3rd instant concerning the proposed amendments to the Penicillin Act. The amendment will not, as Mr. Grattan seems to think, allow anyone to add penicillin to the dietary of his livestock, but only *bona fide* feeding-stuff manufacturers and then only under control.

Mr. Grattan wonders if it might be imprudent to interfere with the natural, normal growth rate of animals. Antibiotics do not interfere with the normal growth rate; they bring a sub-normal growth rate back to the normal. They do not stimulate metabolism like iodinated proteins. They let off the brake but do not accelerate the engine.

Regarding starch, protein and mineral intake; if feeding is based on liveweight gain, as it should be in the case of animal concerned (fattening pigs and poultry), then no difficulty will be encountered.

Mr. Grattan mentions cattle and a possible change in the microfauna and microflora of the rumen. Here again, is not the change from the abnormal to the normal? However, I am open to correction on that point. In any case it is not proposed at present to use the supplement in cattle.

On what authority does Mr. Grattan base his assumption that the change in the ruminal flora, implicated in the aetiology of acetonaemia, is similar to the change produced by penicillin?

Like Mr. Grattan, I sincerely hope that responsible veterinary opinion has been obtained on the subject and that the question of penicillin-resistant strains of organisms has been fully gone into. However, I think we may safely put our trust in the Agricultural Research Council.—Yours faithfully, Stewart Macfarlane, Englewood, Kilmacolm, Renfrewshire.

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THE USE OF A "BOX NUMBER"

Sir,—As a "job-seeker" with a watchful eye on the "Appointments Vacant" columns of *The Veterinary Record* I am surprised at the number of advertisers who find it necessary to make use of a "box number." Surely in an honourable profession this is not entirely necessary.

Even more surprising, perhaps, is the large number of "box numbers" who fail even to acknowledge receipt of applications for appointments. Maybe there is some connection between these two matters!—Yours faithfully, F. Roy-Smith, Captain R.A.V.C., V. & R. Directorate, H.Q. Northern Army Group, B.A.O.R., 1. *February 10th*, 1953.